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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/800,627	03/07/2001	Koichiro Tanaka	SEL 245	3352

7590

08/18/2003

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EXAMINER

THOMAS, TONIAE M

ART UNIT

PAPER NUMBER

2822

DATE MAILED: 08/18/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/800,627

Applicant(s)

TANAKA ET AL.

Examiner

Toniae M. Thomas

Art Unit

2822

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 June 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,4,8,12,16,20 and 24 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,4,8,12,16,20 and 24 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 14.

- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

1. This Office action is an official response to the amendment filed on 05 June 2003.

Currently, claims 1, 4, 8, 12, 16, 20, 24 are pending.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. *Claims 1, 4, 8, 12, 16, and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maekawa (US 6,066,547) in view of Kusumoto et al. (5,953,597).¹*

Maekawa discloses a method of manufacturing a semiconductor device (figs. 4-11 and col. 5, line 24 to col. 8, line 3). The method comprises the following steps substantially as claimed: introducing a metallic element 24 for promoting crystallization of an amorphous semiconductor film into the amorphous semiconductor film 14 (fig. 8 and col. 6, lines 7-29); partially crystallizing the amorphous semiconductor film using a heat treatment to form a first polycrystalline semiconductor film (col. 6, lines 30-67); and annealing the first polycrystalline semiconductor film to form a second polycrystalline semiconductor film (col. 7, lines 1-18).

¹ Maekawa was relied upon in the previous action mailed on 03 January 2003.

The metallic element may be one of nickel, palladium, and platinum (col. 6, lines 9-12 and 24-26).

The semiconductor device is a liquid crystal display (col. 5, lines 38-40).

Maekawa teaches that laser annealing may be used when annealing the first polycrystalline semiconductor film to form the second polycrystalline semiconductor film, wherein the laser annealing is performed using an excimer laser (col. 7, lines 47-49). Maekawa does not teach that the laser beam has a wavelength from 360 to 650 nm, or wavelength from 400 to 600 nm; or that the laser beam is selected from one of a second harmonic of a YAG laser, a second harmonic of a glass laser; an Ar laser, a second harmonic of an YLF laser, and a second harmonic of an YV04 laser.

The Kusumoto et al. patent discloses a method of manufacturing a semiconductor device, the method comprising a step of crystallizing an amorphous semiconductor film (col. 6, lines 3-8). The laser annealing can be performed using various excimer lasers, or the second harmonic of a YAG laser (col. 2, lines 50-59). The second harmonic has a wavelength of 532 nm.

Since both Maekawa and Kusumoto et al. disclose a method for forming thin film transistors, the laser annealing disclosed by Kusumoto et al. would have been recognized in the pertinent art of Maekawa by one of ordinary skill in the art at the time the invention was made.

One having ordinary skill in the art would have been motivated to modify the process of Maekawa by performing the laser annealing using the second harmonic of a

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YAG laser in place of an excimer laser because the second harmonic has a sufficient absorption coefficient to the amorphous semiconductor film and can crystallize the semiconductor film with a high degree of energy efficiency.

Maekawa does not teach that an area of each of amorphous regions in the first polycrystalline semiconductor film is equal to or less than $10.0 \mu\text{m}^2$, or that an area of at least one of the amorphous regions is equal to or greater than $0.30 \mu\text{m}^2$. It would have been obvious to one of ordinary skill in the art at the time the invention was made to form each of amorphous regions in the first polycrystalline semiconductor film having an area equal to or less than $10.0 \mu\text{m}^2$, or to form at least one amorphous region having an area equal to or greater than $0.30 \mu\text{m}^2$, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or working ranges involves only routine skill in the art (*In re Aller* 105 USPQ 233 (CCPA 1955)).

3. *Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Maekawa in view of Kusumoto et al. as applied to claim 4 above, and further in view of Ohtani et al. (EP 0 978 877A2).*²

As discussed above, Maekawa teaches that the semiconductor device is a liquid crystal display. However, Maekawa does not teach that the liquid crystal display is part of a portable telephone, a video camera, a digital camera, a projector, a goggle type display, a personal computer, a DVD player, an electronic book, or a portable information terminal.

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Ohtani et al. discloses a method for forming a liquid crystal display, which comprises a thin film transistor. Ohtani et al. teaches that the liquid crystal display may be incorporated into one of the following devices: computer, a DVD player, an electronic book, and a portable information terminal (figs. 13A-13F and par. [127]- par. [134]).

One having ordinary skill in the art would have been motivated to modify the combination of Maekawa and Kusumoto et al. by incorporating the liquid crystal display into one of a portable telephone, a video camera, a digital camera, a projector, a personal computer, a DVD player, an electronic book, and a portable information terminal, as taught by Ohtani et al., because a liquid crystal display displays a fine image at a high speed.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Toniae M. Thomas whose telephone number is (703) 305-7646. The examiner can normally be reached on Monday through Thursday from 8:30 AM to 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amir Zarabian can be reached on (703) 308-4905. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 305-3432 for regular communications and (703) 305-3432 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

TMT

August 11, 2003



Michael Trinh
Primary Examiner
Act SPE

² The Applicant submitted the Ohtani published application as prior art.